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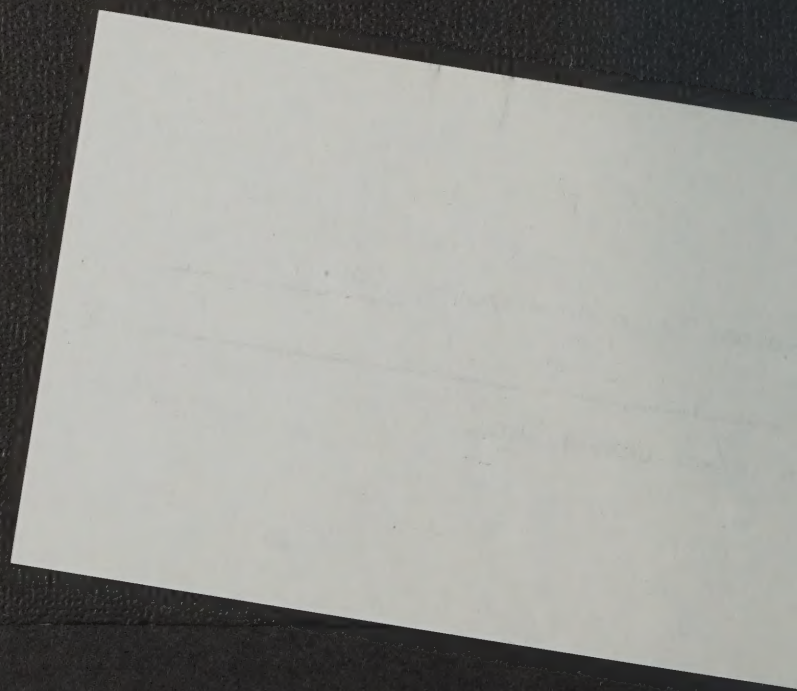
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ARMOUR'S LIVESTOCK BUREAU  
Union Stock Yards, Chicago, Illinois.

MONTHLY LETTER TO ANIMAL HUSBANDMEN

Dear Sir:

March 1, 1924.

This letter finishes the fourth year of our publication. From April onward, the Monthly Letter to Animal Husbandmen will appear in printed form. At the request of several readers, it will be put up with broad margins so that it can be conveniently filed in a permanent folder.

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The Determination of Hog Prices at Public Markets.

The extreme complexity of market and trade procedures makes it quite difficult for the casual or distant observer to understand the fluctuations in price quotations at the public stockyards. Consequently, a multitude of false beliefs and traditions have developed, which charge the market agencies with responsibility for this unstableness of prices.

Frequently, in these letters, we have discussed various phases of the important problem as to which factors are instrumental in determining market prices. In the February 1924 letter, for instance, we showed that the number of hogs marketed over a certain time has a very definite bearing on the prices which they secure, and also that movements of pork into or out of cold storage have no appreciable influence on the quotations.

These more or less preliminary studies led us to direct attention to two factors, which seemed to be of paramount importance in the determination of livestock prices, and which in combination promised to give a practically complete solution of the problem. The first of these factors was, as already mentioned, that of receipts, and the second, that of the price quotations on the different finished commodities.

In the February letter, we discussed the change in the hog and provision business which has taken place in recent years. Formerly, this trade was more or less speculative as the processed and cured pork had to be stored during the winter months when there was a big surplus available, and sold often many months later in periods of scarcity. It was thus necessary to buy the hogs on the basis of provision prices which were expected to develop in the future. As the marketing of hogs has been more evenly distributed over the year, this speculative element has decreased in importance, and it is now generally recognized that hogs are primarily bought on the basis of the prices for which provisions sell at the time of purchasing of the animals.

MEMORANDUM FOR THE RECORD  
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In the February letter, we discussed the...  
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periods of surplus. It was thus necessary...  
the state of provision prices which were...  
the future. As the harvesting of crops...  
included over the year, this speculative...  
in importance, and it is now...  
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The material for the present study comes from the data on hog receipts at public stockyards, on price quotations for live hogs, medium weight at Chicago, and for provisions at eastern points, as recorded in the Monthly Statistical Review of the Livestock and Meat Situation published by the U. S. Department of Agriculture in "Weather, Crops and Markets". The period of time included runs from January 1, 1920 to October 31, 1923.

It is well known that hog prices vary, sometimes being higher and sometimes lower than the average. Simultaneously, receipts vary, and so do the prices on provisions: loins, bacon, hams, picnics and lard. If an increase or decrease in one of these variables is accompanied by a corresponding increase or decrease in another, the two variables are said to be positively correlated. Prices on live hogs and prices on provisions are examples of such an inter-relationship. If, on the other hand, an increase in one variable is accompanied by a decrease in another, and vice versa, these variables are said to be negatively correlated. The relationship between hog receipts and prices is of this nature.

Correlations may be more or less perfect, and the correlation coefficient is a measure of how intimate the relationship between two variables is, expressed in percentage of perfect correlation. A simple case of perfect correlation would be manifest if a doubling in the price of bacon would always be accompanied by a doubling in the price of hogs. In this case the correlation coefficient would be +1.00. If, on the other hand, a doubling of receipts was consistently accompanied by a halving of hog prices, the correlation coefficient between these two particular variables would be -1.00. Ordinarily, the relationship between two variables is not so exact, and the correlation coefficient measures the percentage approach to perfect relationship.

The correlation coefficient also has significance in another way. Its square measures the portion of the variability of one of the variables which is determined by the other, and which disappears in data in which the second variable is constant. If the correlation between two variables is perfect and one is kept constant, the other automatically will be constant. If the correlation is 50 percent and one of the variables is kept constant, 25 percent (or 50 percent multiplied by 50 percent) of the variation in the other would disappear, due to the mere fact of this constancy.

In the present study, we have a number of variables which are all correlated. The following table lists the correlation coefficients:



Live Price	Receipts	- 0.34±0.09
<hr/>		
Live Price	Loin Price	+ 0.70±0.05
	Bacon	+ 0.93±0.01
	Ham	+ 0.88±0.02
	Picnic Shoulder	+ 0.94±0.01
	Lard	+ 0.92±0.02
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Receipts	Loin Price	- 0.64±0.06
	Bacon	- 0.31±0.10
	Ham	- 0.55±0.07
	Picnic Shoulder	- 0.42±0.08
	Lard	- 0.11±0.10
<hr/>		
Loin Price	Bacon Price	+ 0.69±0.05
	Ham	+ 0.77±0.04
	Picnic Shoulder	+ 0.83±0.03
	Lard	+ 0.72±0.05
Bacon Price	Ham Price	+ 0.76±0.04
	Picnic Shoulder	+ 0.92±0.02
	Lard	+ 0.87±0.02
Ham Price	Picnic Shoulder Price	+ 0.90±0.02
	Lard	+ 0.73±0.05
Picnic Shoulder Price	Lard Price	+ 0.87±0.02

Live prices and receipts are negatively correlated, although the coefficient of -0.34 indicates a less pronounced effect than receipts are popularly supposed to have. Live prices and provision prices show a very strong positive correlation, the coefficients ranging from 0.70 to 0.94, indicating a very high degree of relationship.

The relative size of these coefficients indicates that live prices are more closely correlated with the prices on the cured pork products and lard than with loin prices. This fact suggests that live prices are, therefore, more definitely determined by them than by loin quotations. These latter, on the other hand, are more intimately correlated with, and determined by, receipts, reflecting the necessity of the immediate sale of the perishable fresh pork loin in a volume nearly proportionate to the number of hogs received. The cured products and lard can be easily stored and their products are, therefore, less dependent on temporary fluctuations in slaughter. They are consequently the big stabilizer of hog prices in the face of variable receipts.

The whole system of variables presented in the foregoing tabulation is, furthermore, complicated because receipts are negatively correlated with provision prices, and they are very highly positively correlated among themselves. It is of importance to know how far the



variations in hog prices are determined by this entire group of variables, including receipts and the prices on provisions, and to find out how large a proportion of the variation may remain to be accounted for by other determining causes. In order to secure this result, rather intricate statistical methods must be applied, the results only of which, minus the theory, will be presented here.

If the complex of variables listed in the table completely accounts for variation in hog prices, then the degree of determination (the square of the coefficient of correlation between live prices and the variables taken together) should be 100 per cent. As a matter of fact it turns out to be 100.5 per cent. The slight excess over the possible maximum is most likely due to a slight inconsistency due to the carrying of the correlations to only two decimal places. At any rate, the degree of determination is practically perfect and live prices are virtually an exact linear function of the six variables we studied. It is, therefore, evident that all of the variation in monthly hog prices is accounted for by the variation in receipts and provision prices. No variation is left to be accounted for by the suspected factors of price manipulations so commonly charged by agitators. AS A RESULT OF THIS STUDY, IF RECEIPTS WERE CONSTANT AND MEAT PRICES WERE CONSTANT, HOG PRICES AT PUBLIC MARKETS WOULD NOT DISPLAY ANY VARIATION.

It is interesting to note in this connection that provision prices not only are important in determining the market prices on hogs, but that they are predominant in comparison with receipts. Thus, determination of hog prices by the two factors, ham price and lard price is 93.9 per cent, adding bacon price raises the figure to 96.5 per cent, adding picnic price raises it to 96.8 per cent, and finally, adding loin price brings the determination up to 98.0 per cent.

There is some satisfaction which the producer may derive from this collection of data. He may feel confident that the price on his hogs to a remarkably high extent reflects the number of hogs being marketed and particularly the prices it is possible for the meat selling agencies to secure on the finished product. There are no obscure factors which exercise a disturbing influence to any appreciable degree.

Very truly yours,

Edward N. Wentworth, Director  
Tage U. Ellinger

Acknowledgment of the assistance of Dr. Sewall Wright of the Bureau of Animal Industry in checking our computations and statistical methods is offered herewith.



# MONTHLY LETTER TO ANIMAL HUSBANDMEN

EDWARD N. WENTWORTH  
DIRECTOR

ARMOUR'S LIVESTOCK BUREAU  
ARMOUR AND COMPANY, UNION STOCK YARDS  
CHICAGO, ILLINOIS

TAGE U. H. ELLINGER  
ASSISTANT DIRECTOR

VOL. 6, No. 8

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NOVEMBER, 1925

## PRICE PREMIUMS AND CATTLE IMPROVEMENT

As a result of the disturbed economic conditions that obtained during the World War and the period since, many cattlemen have felt that all pre-existing ideas of livestock values and methods of improvement have been completely displaced. One of the prime factors in developing this viewpoint has been the seasonal opportunity which has existed for several years of making more money on cattle of inferior breeding than on cattle of better blood. Since the better-bred animals have been produced as a result of the lessons of more than a century, it has proved very disconcerting to breeders to have such changes in ideas and ideals.

Beef type has come to be traditional, and it may take most of a man's lifetime to learn the characteristics of the specialized beef breeds and the method of their production. The fundamental difficulty has always been that the demand for cattle has changed at just such a rate that the type, which the older generation demonstrates to the younger as desirable, is beginning to go out of style when the younger generation has its herds organized for satisfactory production. From the beef breeder's standpoint two great

forces have influenced changes in type—the showyard and the market. From the commercial standpoint, however, the market has produced the principal effect.

If one, therefore, analyzes the points for which price premiums above the ordinary run of cattle are offered, it is not difficult to anticipate what the future trend of development in breeding will be. In studying the market situation, however, it is very easy to be misled in interpretation, and care must always be taken to forestall fallacious conclusions. A pertinent example of the latter is found in the belief of many feeders, already noted, that the market no longer pays for well-bred animals in comparison with scrubs. Nothing could be further from the truth. The actual condition is exactly the reverse, although there are certain times of the year when the *premium* for light-weight animals exceeds the *premium* for well finished animals of proper conformation and quality but above the most popular market sizes. It is certainly a mistake to assume that because this premium sometimes exceeds the old established premiums, that the traits which were formerly desired are no longer valuable.

The scientific improvement of livestock dates back some 175 years. It is not necessary in this brief discussion to review the individual efforts of the pioneer breeders, but a



Fig. 1. Type of steer previous to improvement for beef purposes, the principal use being for draft.

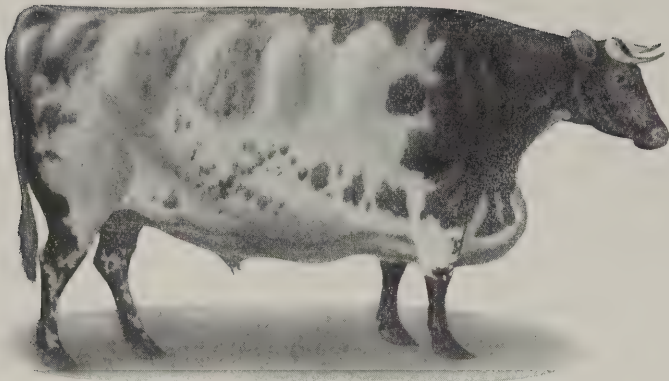


Fig. 2. The "Durham Ox", representative of the first improvement for beef. Note blocky form but great patches of flesh.

study of their results should be especially informative in considering this question. Breeding for meat quality centers in Great Britain, and the first improvement came from the introduction of the large, coarse boned, heavy framed, rather roughly built cattle of Flemish blood. Previous to the introduction of these animals, most British cattle were chosen especially for draft purposes. After an ox had rounded out a six or seven-year life at the plow or on the cart, he was fattened and sold on the market for beef. An animal lacking somewhat in size but possessing the general type or absence of type

of these unimproved animals is shown in Figure 1. Most characteristic was the light muscling over the back, loin and hindquarters and the general difficulty of fattening.

The first improvement required was with reference to the fattening qualities, especially with regard to the amount of fat the animal would carry, but also a certain degree of improvement was effected in the rate at which it would fatten. Robert Bakewell of Dishley Grange, Leicestershire, was the pioneer in this direction. His chief energies were directed toward carcass quality, dressing percentage and the proportion of valuable cuts, but he also made great strides in improving the degree of fattening and the early maturity of the animal. The *first price premium* which the market was willing to pay, therefore, was for animals which carried heavy carcasses thickly covered with fat and with the muscle fibers richly marbled. An example of the perfection of this type is shown in Figure 2, an animal known as the "Durham Ox" produced by Robert Colling and shown all over England during the last half decade of the 18th century. This animal attained a maximum weight of 3,400 pounds, and showed an enormous covering of carcass, with great patches of fat over the hips and sides.

It was soon realized, however, that neither the butcher nor the beef purchasing public could endure such a heavy waste of flesh and such a great amount of trimming as was necessary to bring the cuts of beef down to proper consumptive standards and the *second price premium* was paid for a reduction in the wastefulness of the carcass. The point at which this demand for smoothness was most strongly emphasized was with the butcher, because he could afford to pay more for animals lacking patchiness and waste, and was consequently better able to dominate his local market. This forward step in type was well exhibited by the wonderful ox of Earl Spencer's, which was Smithfield champion in 1835. It showed as great a development as its predecessors, but its type, as shown in Figure 3, was tempered by the demand of the butcher who would no longer tolerate the enormous rolls of fat that characterized the famous "Durham Ox".



Fig. 3. Earl Spencer's ox, typifying improvement to reduce waste. Note smoothness as compared to the "Durham Ox".



Fig. 4. John Bell, a Shorthorn steer weighing 1,650 pounds at 30 months. Early maturity with same beef carcass as Earl Spencer's ox.

The *third price premium* for a change in animal type arose from the needs of the producer himself. Costs of production rose so rapidly during the last part of the past century that emphasis was annually increased on early maturity and weight for age. At the old Lake Front Fat Stock Shows held in Chicago during the 80's, three and four-year-old bullocks were exhibited. Many famous animals ranging from 2,000 to 3,000 pounds were shown such as "Nichols", "John B. Sherman", "Nels Morris", and "Barney". Yet the pressure for early maturity and the initial demand for smaller cuts was such that, by the time the International Livestock Show opened in 1900, there

were no exhibits of bullocks older than three years in the single classes, nor older than four years in the carload lots. As a matter of fact, the 90's saw the rising dominance of two-year-olds, and many steers were exhibited between 1900 and 1910 that weighed from 1,600 to 1,800 pounds at thirty to thirty-two months. In commercial cattle, the two-year-olds were weighing as much at this period as four and five-year-olds were weighing twenty-five years before. No illustration is offered to represent the transitional stage between Earl Spencer's ox and the quick-maturing steer exhibited early in the present century. Figure 4 shows the two-year-old Shorthorn steer, "John Bell" shown by the Iowa State College, about 1911. This bullock's 1,650 pounds at thirty months were typical of the heavy weights characteristic of the past century, but now produced at earlier ages.

The *fourth price premium* arose from the desires of the consumer. Just before the war, a rapidly-increasing demand came into effect for the production of lighter animals. This demand resulted primarily from the reduction in the average size of families, the increasing proportion of urban population, and the change in method of housing from the family home to the small apartment and kitchenette. When the majority of city dwellers entered quarters thus cramped, the day of thick, juicy roasts of beef and big baked hams was past. To a certain extent, this was anticipated in some of the awards of the early Internationals. In 1906, a 15-months-old Hereford calf attained the supreme honors, followed by a Shorthorn calf of similar age in 1907. Such awards were contrary to all tradition and stirred bitter invectives in many of the agricultural papers on the substitution of veal for beef. Nevertheless, the public liked the substitution, and with the award of the championship to yearling carlots in 1910, the new ideal was thoroughly established. In fact, from 1917 to 1921 the pressure of the consumer for light-weight cuts became so great that premiums were actually paid for cuts from light-weight heifers and dairy cows over cuts from heavier and better finished animals.

Out of the last condition has arisen the confusion referred to in the opening paragraph with regard to the value of employing beef-bred animals in supplying



Fig. 5. Chenoweth Jock, 13 months Shorthorn calf, weighing 1,000 pounds. Typical of baby beef producing light-weight cuts desired by consumers.

quality trade in the market. The lessons of a century and a half in livestock improvement have not been overthrown, but a new factor of light weights has developed which must enter into consideration in order to meet public demand.

The only method available to the breeder of beef animals whereby he can compete favorably with the producer of cold-blooded lighter animals is to mature his calves at still earlier ages in the form of baby beef. Such an animal is shown in Figure 5, the Short-horn calf which was champion at the 1922 International. Calves of this type not only present the quality and marbling of meat which partially satisfies the epicure, but they produce the light-weight cuts which satisfy the demand of the average family. Especially important in developing the ideal of baby beef has been the work of the boys' and girls' clubs, which has demonstrated in a practical way all over the cattle feeding country efficient methods of making this final concession to the consumer.

Yet baby beef alone will not provide the entire solution. There are large areas of the United States where cattle are produced which are incapable of growing grains and concentrates. Baby beef require the rapid finish possible only when such feeds are available. Apparently, a still further degree of specialization, especially in the range country and the feed lot is necessary before the most efficient methods of cattle production are developed. Undoubtedly, the majority of range cattle producers will be forced to market their cattle crop annually in the form of feeder calves. This will provide a still broader outlet for well-bred cattle because only calves of beef breeding can be used under this system of management. Calf feeding will meet every requirement of both producer and consumer except the major one of *utilization of roughage* on the corn-belt farms. On the range, breeding cows may consume the grass now used in maturing steers, but roughage production on small farms is too great to permit a general substitution of breeding for feeding operations. In part, this roughage may be utilized for dairy cows, and, in part, it may be used to fatten thin cows off the range which are no longer required for breeding purposes. Two other uses, however, will exist. In the first place, there still remains a demand for heavier beef in the hotel, club and restaurant trade that will take from 12 to 15 percent of the cattle marketed. Steers producing such beef can profitably consume large quantities of rough feeds. In the second place, there must still be a certain degree of beef breeding outside of the range, providing an important outlet for roughage as well.

Nevertheless, a problem exists in adjusting breeding so that calves possessing weight for age and the quick-growing, quick-finishing type desirable for baby beef production can be gotten from the same dams and sires that also produce yearling feeders suitable for making heavier beef. It is very difficult under the same systems of breeding and with the same blood lines to secure calves that will mature as baby beef at around a thousand pounds in fourteen months, and, at the same time, mature as heavy beef around 1,300 pounds at thirty-two months. In too many cases, calves with such a baby beef record weigh 1,500 to 1,800 pounds under the same conditions. The cattleman is really facing the same problem which the sheepman faced between 1905 and 1910—the problem which forced him to operate on the lamb and ewe basis on the range. If precedents mean anything, the range cattleman of the future must operate in a parallel manner on the basis of the cow and calf. Undoubtedly, the next big improvement in beef making will not be a change in type but the development of a specialized system of beef production which will even more markedly limit the geographical region from which animals ready for market are shipped at definite seasons of the year.

**E**FFECTIVE January 1, there will be a change in the Assistant Directorship of Armour's Livestock Bureau.

Dr. Tage U. H. Ellinger is resigning to assume the directorship of the Department of Livestock Economics recently established by the International Livestock Exposition, Union Stock Yards, Chicago.

Dr. Rudolf A. Clemen is appointed to fill the vacancy. Dr. Clemen was formerly a member of the Department of Economics, first of Purdue University and later of Northwestern University. Following this, he was assistant editor of the *National Provisioner*; and, just before assuming the present position, was economist for the Illinois Merchants Trust Company. He is the author of a book dealing with the packing industry; namely, "The American Livestock and Meat Industry".

EDWARD N. WENTWORTH,  
*Director, Armour's Livestock Bureau.*

Information is available from producers, who are primarily seeking profitable production of pork, have little or no guidance in their breeding operations. Furthermore, packer buyers are not adequately informed on the actual cash yields from the various types of hogs which appear at the markets, and are consequently often governed by tradition when accurate buying would favor untraditional price premiums.

The test described in this letter should focus the attention of experimental workers on the economic possibilities of further type testing work. Secondly, it should throw some light on the possible merits of changing the common market type of hog in the direction of greater length and meatiness. Three preliminary tests were made with three pairs of carcasses, the two members of each pair being of approximately the same dressed weight but differing in length. All carcasses were cut up in the customary way in packing house routine. The cuts were graded, priced and the differences in commercial value were ascertained on the basis of 100 lbs. dressed weight.



Fig. 1. Load of long bodied hogs from D. D. Casement

TABLE 1		Difference in Value in favor of the long carcasses
	Difference in Length	
Pair No. 1	3 inches	13 cents per dressed cwt.
Pair No. 2	3½ inches	34 cents per dressed cwt.
Pair No. 3	4¾ inches	59 cents per dressed cwt.

The longer carcasses being consistently more valuable, a more extensive investigation was planned in order to test further the conclusion suggested by the preliminary trials. Two carloads of hogs were purchased on the Chicago market for this particular purpose. A load of 70 long-bodied hogs were secured from D. D. C a s e m e n t , Juniata Farms, Manhattan, Kansas (Figure 1). Another load of 81 shorter hogs were purchased from Clarence Lee, Shullsburg, Wisconsin (Figure 2). Neither of these loads represented extreme types. The Casement hogs were crossbred Yorkshire-Poland Chinas and Yorkshire-Duroc Jerseys. The Lee hogs were high grade Poland Chinas. The latter load was selected as typifying the best grade of market hogs of butcher type. It was the consensus of opinion among the hog buyers on the market that they were better finished and more desirable hogs than the crossbreds. The average weight was approximately the same for both loads, the Casement hogs averaging one and one-half pounds heavier. These hogs also dressed out higher although the short hogs yielded almost two percent more than the average packer purchases at the season of the year when the hogs were bought.

TABLE 2.

	Long Hogs	Short Hogs
Average Live Weight.....	203.87	202.27
Average Dressed Weight (cold).....	143.60	139.20
Dressing Percentage.....	70.44	68.82

Both loads were slaughtered, dressed, chilled and cut in the ordinary commercial manner applying to pork for the domestic market. The products were graded in the regular way and all grades were priced according to current quotations. The by-products were handled in a similar manner, with the exception of casings and hair, which were not included in the test. The length of all carcasses was measured in the cooler using the aitch-bone and the front edge of the first rib as measuring points. The long hogs averaged 29.03 inches, the short hogs 26.95. The difference between the two loads amounted to 2.08 inches in favor of the Casement hogs. The final results of the test are presented in Table 3. Differences in the price quotations given for the long and short hogs in this and following tables result from differences in the distribution of the products of the two loads among the various grades.

TABLE 3.

	Long Hogs			Short Hogs		
	Pounds Products	Av. Value Per Pound	Total Value	Pounds Products	Av. Value Per Pound	Total Value
Per Animal.....	155.72	15.71c	\$24.46	150.22	15.54c	\$23.35
Per 100 Pounds						
Live Weight ..	76.38	15.71	12.00	74.27	15.54	11.54
Per 100 Pounds						
Carcass Weight ...	108.44	15.71	17.04	107.92	15.54	16.77

The net results in the foregoing table, favoring the long hogs, are listed in Table 4.

TABLE 4.

	Pounds Product	Av. Value Per Lb.	Total Value
Per Animal.....	5.50	.17c	\$1.11
Per 100 lbs.—Live Weight.....	2.11	.17	.46
Per 100 lbs.—Carcass Weight.....	.46	.17	.27

In other words, the packer buyer could have paid 46 cents per live cwt. more for the Casement hogs than for the other load and have come out even. If, for the sake of argument, the advantage of a higher dressing percentage for the long hog load is eliminated, these hogs would still be worth about 20 cents more per live cwt. The difference amounts to \$65.64 on a load of 70 hogs; or, if the hogs had not dressed out higher than those of the other type, about \$29.00.

A more detailed account of the killing results is given in the following table which contains a record of the average yield per animal, the value of the various items on a pound basis, and the total value of each product. The killing by-products include the edible by-products such as the brain, heart, liver, tongue, etc. The cutting by-products include trimmings, feet, tails, etc.

TABLE 5.

	Long Hogs			Short Hogs		
	Pounds	Av. Value Per Lb.	Total Value	Pounds	Av. Value Per Lb.	Total Value
Loins .....	21.25	23.10c	\$4.91	19.15	23.31c	\$4.46
Hams .....	29.55	15.66	4.63	29.21	15.46	4.52
Picnics .....	11.58	15.08	1.75	9.55	15.14	1.45
Boston Butts.....	10.14	20.00	2.03	7.73	20.00	1.55
Jowl meat.....	3.11	13.34	.41	2.70	13.39	.36
Spare ribs .....	3.17	16.00	.51	2.91	16.00	.47
Fat backs .....	13.45	12.04	1.62	15.38	11.85	1.82
Bellies .....	25.32	16.31	4.13	26.66	16.19	4.32
Lard .....	19.60	15.14	2.97	20.23	15.15	3.06
Killing by-products...	10.14	7.19	.73	9.06	6.79	.62
Cutting by-products..	8.41	9.21	.77	7.64	9.45	.72

The differences in favor of each type of hog are listed separately in table 6. It appears that the long hogs yield more of the highest priced lean cuts, notably loins and Boston butts. On the other hand, the short hogs yield more of cheaper fat cuts, especially fat backs, bellies and lard.

TABLE 6.

	Differences in favor of long hog			Differences in favor of short hogs		
	Lbs.	Av. Price Per Lb.	Total Value	Lbs.	Av. Price Per Lb.	Total Value
Loins . . . . .	2.10		45c		.21c	
Hams . . . . .	.34	.20c	11			
Picnics . . . . .	2.03		30		.06	
Boston butts . . . . .	2.41		48			
Jowl meat . . . . .	.41		5		.05	
Spare ribs . . . . .	.26		4			
Fat backs . . . . .		.19		1.93		20c
Bellies . . . . .		.12		1.34		19
Lard . . . . .				.63	.01	9
Killing by-products . . . . .	1.08	.40	11			
Cutting by-products . . . . .	.77		5		.24	



Fig. 2. Load of short bodied hogs from Clarence Lee

Another interesting feature is that the lighter cuts generally command the highest price per pound. The lighter loins of the short hogs are quoted higher, as are also the fat backs and bellies of the long hogs.

The Casement hogs were raised and finished on a typical corn belt ration of shelled corn and tankage in self feeders and alfalfa pasture. It has been claimed that the system of agricultural production in the corn belt does not permit the economic production of the meatier types of hogs and that the American market does not appreciate the merits of leaner pork cuts. The present test, while not final, does not substantiate these claims. It does indicate that further studies and revisions of hog types are imperative.

*The assistance and co-operation of Mr. Frank E. Brandt, General Test Department, Mr. J. M. Waters, Head Hog Buyer, and Mr. Chas. Eikel, Superintendent, Chicago plant, is gratefully acknowledged.*

# MONTHLY LETTER TO ANIMAL HUSBANDMEN

EDWARD N. WENTWORTH  
DIRECTOR

ARMOUR'S LIVESTOCK BUREAU  
ARMOUR AND COMPANY, UNION STOCK YARDS  
CHICAGO, ILLINOIS

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ASSISTANT DIRECTOR

VOL. 6, No. 10

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JANUARY, 1926

## CHANGES IN LIVESTOCK MARKET RELATIONSHIPS

The development of livestock markets in the United States followed the moving frontier across the continent. The methods of livestock selling in the early days in Ohio and Illinois were simply those developed earlier in the auction markets and cattle fairs of Pennsylvania, Virginia and New England.

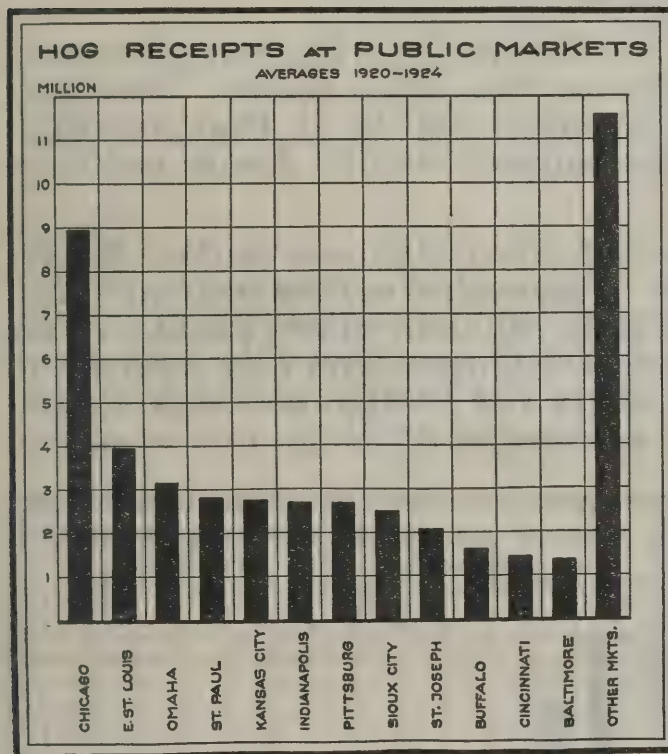
For example, the same terms were used in the Middle West cattle fairs as in the East, the distinction between "stock feeders" and "stock raisers" being established in Lancaster County shortly after the Revolution.

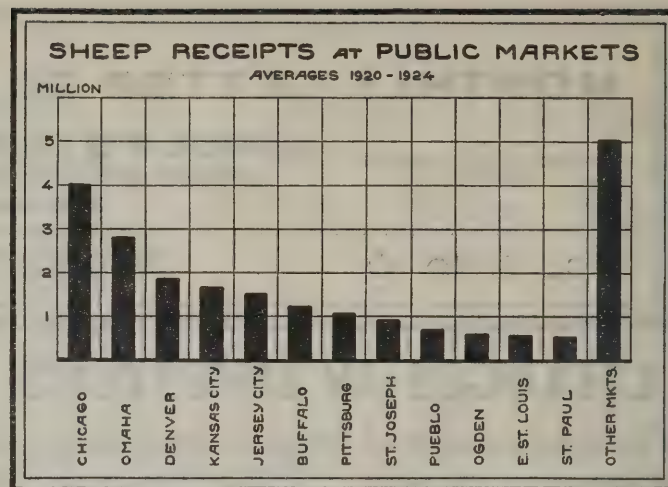
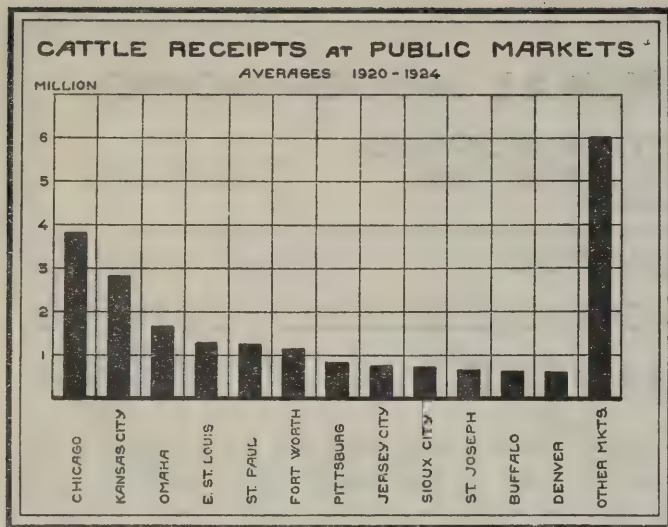
The earliest markets were in Boston, New York and Philadelphia, but as population moved westward other markets grew up. At one time, Albany in New York state, was thought to be the final gateway for western cattle. Then Buffalo, Pittsburg and Cincinnati were, in their turn, regarded as the future great markets of the United States, until Chicago, by virtue of its location and railroad facilities, became in 1870 the largest cattle market in the country.

Population continued to pour into the country west of Chicago and in a short time other livestock markets were developed by the pioneers to take care of the need for transporting livestock and meat

from the great western ranges to consumers in the industrial East. One phase of this movement was the rapid extension of railroads westward to meet the Texas cattle trails.

The first of the centralized cash livestock markets set up west of Chicago was at Kansas City in 1871, built by a few enterprising railroad officials and stock traders, while in 1872 the St. Louis National Stockyards were opened. Both of these markets were created because of the necessity for a home market for the farmer's and the ranchman's maturing stock. The cattle raiser wished to sell at the nearest point possible. On the other hand, buyers from the East preferred to buy at a central point like St. Louis or Kansas City rather than to go to the prairies. These towns were logical markets, for as the region directly tributary to the Missouri river developed it proved to be good corn-

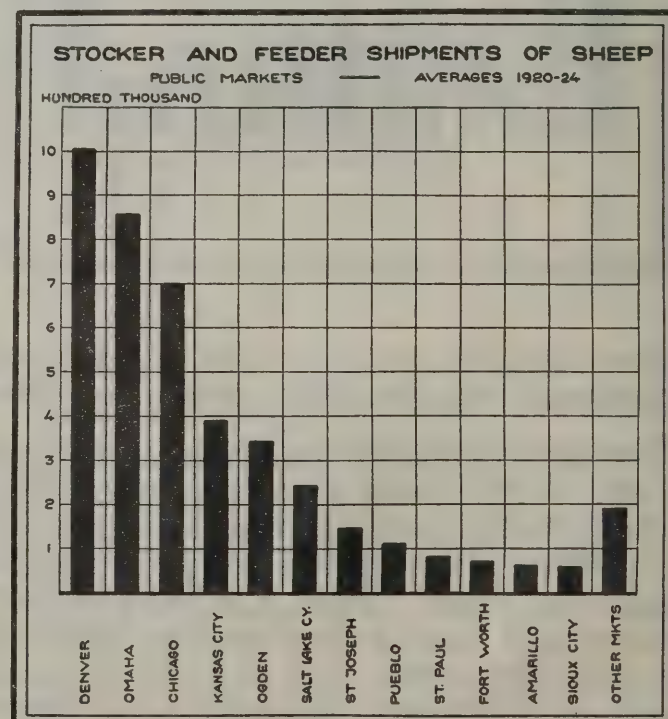
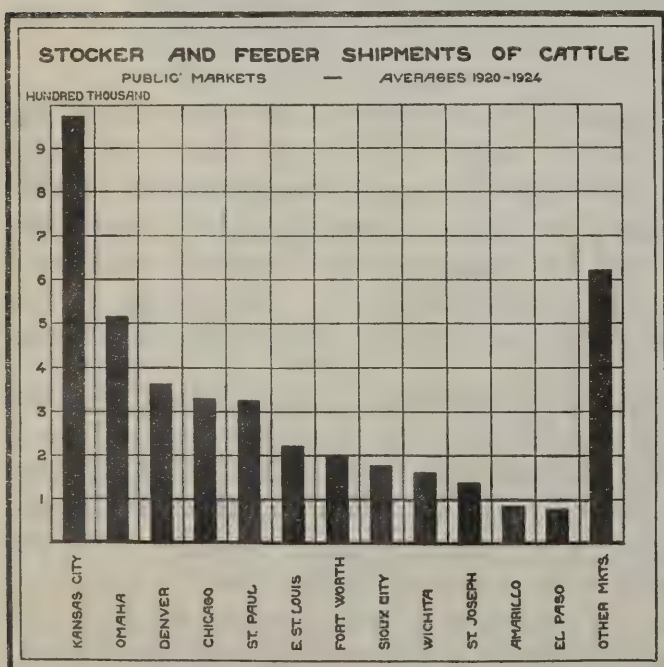


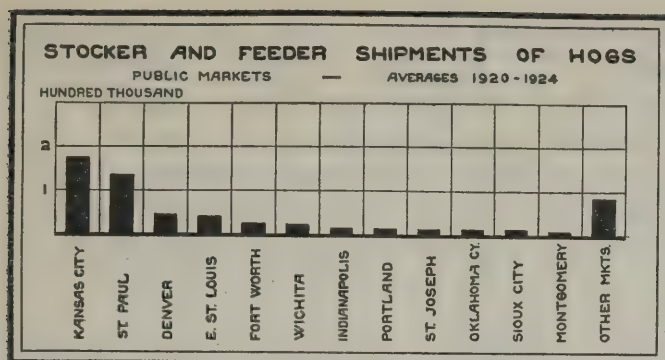


growing and livestock-fattening territory. Packing houses were, therefore, established at these markets and the industry developed rapidly.

Similarly, other markets arose in the eighties. In 1884 the Union Stockyards Company at Omaha was organized, to become in ten years our third largest market. Two years later, in 1886, the Denver Union Stockyards Company and the St. Paul Stockyards Company started operations as livestock market outposts, with St. Joseph and Sioux City following in 1887.

The fundamental reason making possible this rush to establish new markets was the wave of new railroad construction after 1879. This resulted in three transcontinental lines, the Northern Pacific, the Atlantic and Pacific, and the Southern Pacific. At the same time, the Union Pacific, by the construction of its Oregon Short Line northwest to a connection with a branch of the Oregon Railway and Navigation Company's system, the Atchison, Topeka and Santa Fe by construction of its line to a connection





with the Southern Pacific, and the Chicago, Burlington and Quincy by the construction of its Denver extension, added three other important routes to the Pacific Coast.

While all the principal markets were established by 1890, and the stimulation of livestock production resulting therefrom was completed, these changes since 1900 reflect the stabilization of production in the different livestock regions, as well as

further developmental trends. The remainder of the letter will deal with changes of this type, but, first, a summary of the present ratings of the various markets will be given to orient the viewpoint. The following table shows how much an individual market's rating on cattle, hog, and sheep receipts varies, and reflects the production of the territory contiguous to the market or else the natural channel of livestock movement.

PRESENT RATING OF MARKETS (Average, 1920-1924)

	Cattle	Hogs	Sheep		Cattle	Hogs	Sheep
Chicago .....	1	1	1	Indianapolis .....	13	6	22
Kansas City .....	2	5	4	Buffalo .....	11	10	6
Omaha .....	3	3	2	Jersey City .....	8	15	5
East St. Louis .....	4	2	11	Denver .....	12	19	3
St. Paul .....	5	4	12	Cincinnati .....	15	11	14
Sioux City .....	9	8	19	Baltimore .....	19	12	17
St. Joseph .....	10	9	8	Pueblo .....	24	53	9
Fort Worth .....	6	18	16	Ogden .....	27	25	10
Pittsburg .....	7	7	7				

More significant for livestock producers is the relative rating of the markets on stockers and feeders. The following table supplements the graphs by showing how each market rates in shipments of feeder and stoker cattle, hogs and sheep.

STOCKER AND FEEDER SHIPMENTS (Average, 1920-1924)

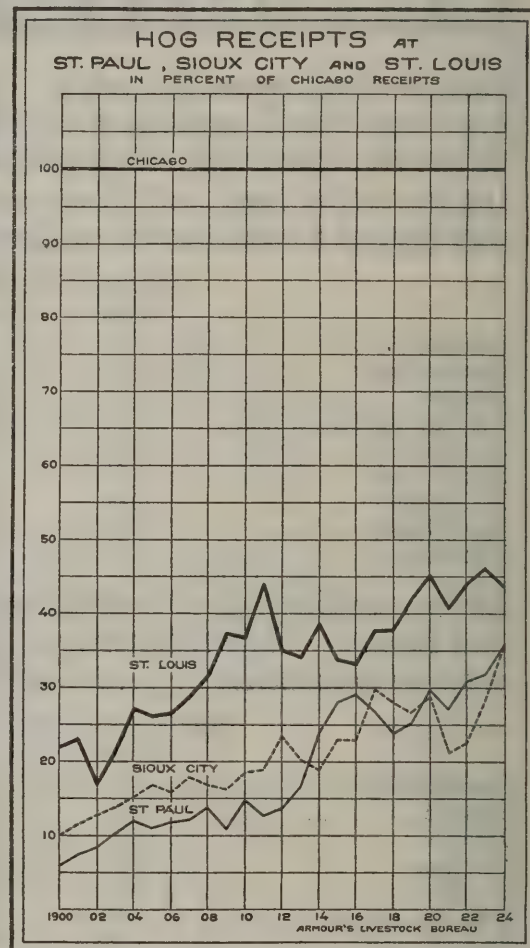
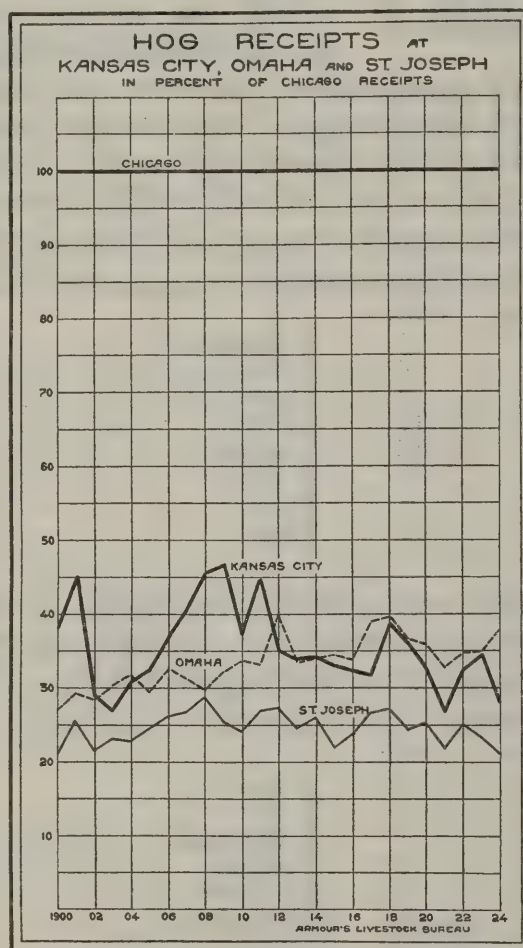
	Cattle	Hogs	Sheep		Cattle	Hogs	Sheep
Kansas City .....	1	1	4	Amarillo .....	11	60	11
Omaha .....	2	15	2	El Paso .....	12	21	14
Denver .....	3	3	1	Indianapolis .....	15	7	23
Chicago .....	4	30	3	Portland .....	22	8	19
St. Paul .....	5	2	9	Oklahoma City .....	13	10	27
East St. Louis .....	6	4	13	Montgomery .....	23	12	59
Fort Worth .....	7	5	10	Ogden .....	16	17	5
Sioux City .....	8	11	12	Salt Lake City .....	25	31	6
Wichita .....	9	6	18	Pueblo .....	19	62	8
St. Joseph .....	10	9	7				

From the standpoint of the trend of livestock production, the relative growth and stability of other markets since 1900, with reference to Chicago, is perhaps of more significance than the current rating. This is especially true of hogs, which are often considered the keystone of the packing business. The greater development of some sections as hog-producing regions should naturally be reflected by increased receipts at the market centers of these districts. Since 1900, there has been a noticeable growth of regional packing plants, particularly through the Northwest, and the markets express this trend—a trend which began before the Great War.

Taking six of the chief hog markets, viz., St. Louis, Sioux City, St. Paul, Kansas City, Omaha and St. Joseph, and comparing them with Chicago, it is found that three have increased with relation to Chicago, while three—Kansas City, Omaha and St. Joseph—have decreased, though they showed an increase for the first few years of the century.

The greatest gains have been made by St. Paul and Sioux City. The reasons for this can be found in the data presented in the August (1925) Monthly Letter. The north-west dairy belt, the wheat belt and the mountain states have been rapidly increasing their hog population. The dairy belt, for over a decade has been using its natural feed resources of small grains and dairy by-products to develop high-quality hogs. In the wheat belt, on the other hand, the increase in hog production dates from the post-war slump in wheat prices. It is but natural then that the logical markets for this region of increasing hog population should show the greatest growth compared to Chicago.

Among the markets showing a relative decrease since 1900 is Kansas City, the change in trend developing more than fifteen years ago. The reason for this interesting change is not perfectly apparent, although, fundamentally, it is probably the result of the relative decrease in corn production and increase in wheat production in Kansas and Missouri, the two principal states adjoining the Kansas City market. The following table shows the changes in average production of these two crops in the two states mentioned for the past five years, and for a five-year period a decade and a half previous.



	WINTER WHEAT (Thousand Bushels)			CORN (Thousand Bushels)		
	Average	Average	Per cent	Average	Average	Per cent
	1905-09	1920-24	Increase	1905-09	1920-24	Decrease
Missouri .....	27,960	34,742	24.25	218,063	188,230	13.68
Kansas .....	77,256	126,320	63.50	170,783	116,175	31.97

The trend of hog receipts at other livestock markets compared to Chicago as a base is set forth in the two accompanying charts. Similar trends for cattle and sheep will be given in succeeding letters as well as a more detailed study of the causes for changes in livestock market relationships which have been simply suggested in this present letter. In order to do so in a comprehensive manner it will be necessary to consider not only the major markets but such markets as Fort Worth, Denver, Ogden, Salt Lake City, Spokane, Portland and Los Angeles, all of which have shared distinctly in the regional changes in the livestock markets and their effect on the packing industry.

# MONTHLY LETTER TO ANIMAL HUSBANDMEN

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VOL. 6, No. 11

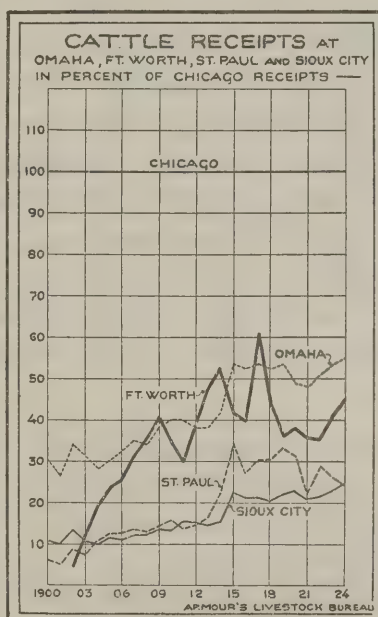
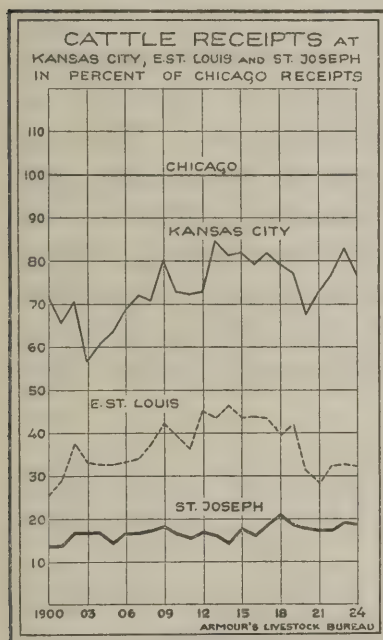
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FEBRUARY, 1926

## LIVESTOCK MARKETS MOVING NEARER PRODUCERS

While westward progression of the early livestock markets paralleled the rate of the westward movement of production, the attainment of the Pacific Coast prevented further movement of this sort.

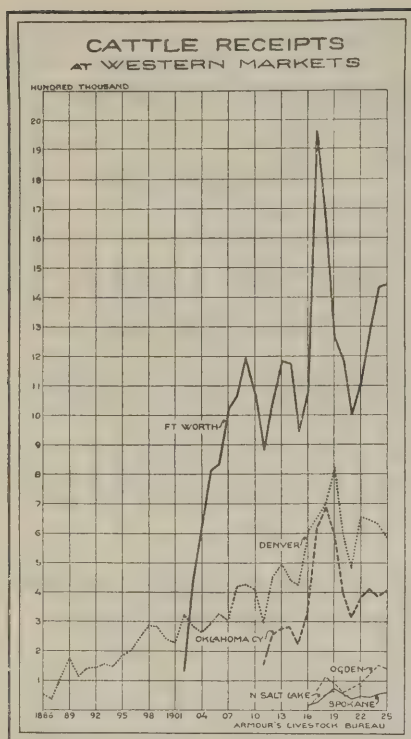
The last quarter century has seen a rapid development in the approach of the livestock market to the doorway of the producer. This has resulted not only from the develop-



ment of new, small, public markets in the producing territory, but also from the development of country stockyards and concentration points. Nevertheless, the westward trend of cattle production continues. If one examines the receipts at the six chief cattle markets since 1900, it will be observed that Omaha, St. Joseph and Kansas City have remained either stationary, or gained only slightly with reference to Chicago, while Fort Worth, St. Paul and Sioux City, in the southwest and northwest territory, respectively, have made phenomenal gains. The accompanying charts suggest that the movement of the market further into the cattle producing areas

has been the principal factor making possible the big gains in those districts. To an increasing degree, beef cattle breeding is being limited to the range country. Fort Worth's improved position as a market, especially during the war years, is undoubtedly based on this fact, for it is the outlet for the best breeding country in the United States.

The story in sheep is somewhat similar. Sioux City has made a tremendous gain, running up from 30 or 40 to 670 percent. Omaha rose to 260 and Kansas City to 220. On the other hand, Chicago and St. Paul have fallen slightly, while the producing regions which they serve have stabilized their type of agriculture. The growth of Sioux City in sheep receipts has undoubtedly been due to the concentration of sheep feeding in the adjacent territory of Iowa and Nebraska. The development at this market has been steady rather than spasmodic and has resulted from the competitive facilities Sioux City



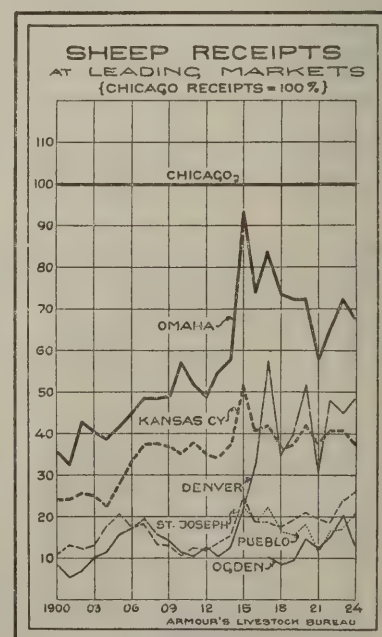
has offered for Omaha. Furthermore, Sioux City has developed very rapidly as an outlet for feeder sheep, mostly drawn originally from the Denver territory.

One of the most interesting developments in the growth of livestock marketing today is the increase in the number and importance of local or regional markets. As producing areas have developed in the farther regions of the country, local livestock markets have come as logical necessities. This tendency for the markets to approach nearer to the sections of production is one of the best evidences of the keenness of competition in the packing industry, as it is becoming increasingly important for the packers to establish themselves near adequate livestock supplies.

Livestock producing regions which have developed as rapidly as the northwest and the Pacific Coast are entitled to livestock markets of their own. With their increased outlets, an additional value is brought to their livestock through locating their market centers nearer their consuming regions.

The initial forces stimulating the development of new livestock markets may be found in the situation at Spokane, Washington. The circumstances which caused the establishment of the Spokane yards were, first, the location of Spokane in the center of an excellent livestock territory; second, the possession of transportation facilities from four transcontinental railroads, having numerous feeding lines; third, the operation of two packing plants already located at Spokane; and, fourth, the necessity of serving small producers who were unable to assemble train loads for the eastern markets in the same manner practiced by the larger producers and shippers.

Spokane is typical of this recent market development. Portland has increased in importance as a market since about 1907, while two intermountain markets, Salt Lake City and Ogden, have grown into important centers, especially for sheep, since the war. The significance of Salt Lake City as a market today is reflected in the fact that it has become the headquarters of a large number of livestock and wool growers' associations. Only a short distance from Salt Lake City is the other new intermountain livestock market of Ogden. Up to 1922 the receipts at Ogden consisted almost entirely of livestock in transit. The establishing of a packing plant about this time developed a sale market at this point, and today the Ogden market handles more cattle than any stock yard west of Denver. One of the newest of the western markets is located at Los Angeles, at present the only central livestock market in California. Prior to its establishment, the entire cattle supply of the state was moved by direct country buying, but the necessity of providing an



outlet for the smaller producers, who lacked the livestock to attract buyers, as well as of registering the premiums for well-bred and well-fed cattle, stimulated the establishment of these yards. Los Angeles is the big packing center of the Coast with some eighteen packing establishments and between 20 and 30 smaller operators.

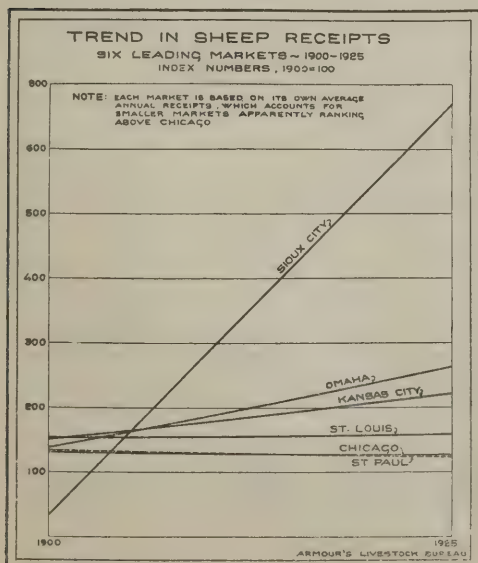
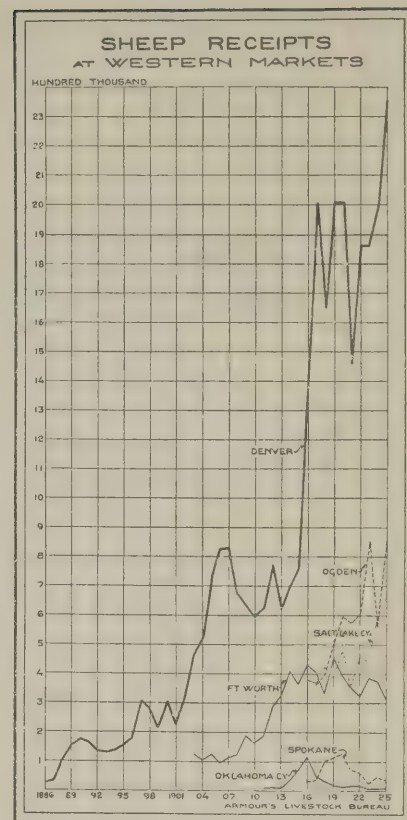
One of the important services which the opening up of these western markets has brought about has been the change in the method of cattle trading. Before the public markets were available, cattle were treated as more or less of a commodity without much reference to differences in quality, breeding and finish. Since the establishment of these markets the producer of the better grades of cattle has received more encouragement and a higher price.

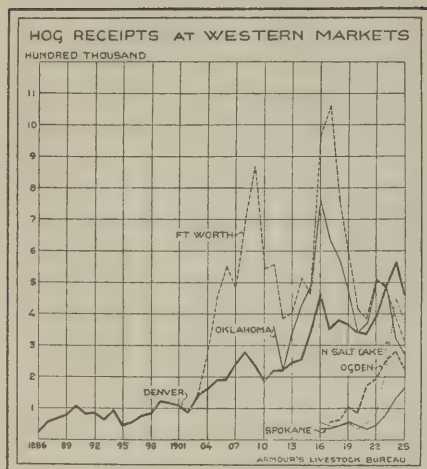
The growth of the Coast as a consuming center has provided the principal economic pressure behind this movement. Seattle, for example, has grown since 1890 to a population of 411,000; Portland, San Francisco and southern California have made equal gains. Many new cities have become important from tiny villages, as, for example, Longview, Washington, which had practically no population four years ago and now has 60,000 people.

One of the important factors aiding the increase in livestock markets has been the change in type of trade due to the development of neighborhood and chain stores. For example, in Tacoma there used to be only the large mill stores which served the biggest logging center in the world. Today, these commissary stores have almost disappeared and neighborhood stores have grown up, affecting fresh meat consumption very favorably.

One of the important problems arising out of the development of the west coast as a consuming region has been the conflicting price levels operating for livestock production. For example, in hogs the demands of the Pacific Coast markets are expressed at certain times of the year as far east as the Missouri river. Especially is their effect felt in West-

ern Nebraska, Colorado and central Kansas. The normal price level for hogs in this region is that established at Chicago, by the demands for producers from the Atlantic seaboard. This price level differs only by the cost of transportation from these regions to Chicago and fluctuates in accordance with business and consuming conditions of the East. Due to the great distance of the Pacific Coast from this region, to the high transportation charges by railroad, and to the competition of shipping via the Panama Canal, there is practically no correspondence between the price fluctuations in meats on the two coasts. It often happens, therefore, that the prices on the Pacific Coast rise when they fall on the Atlantic, and vice versa. This results in particularly jumpy prices for hogs in the intervening country, especially in that fringe through Nebraska,

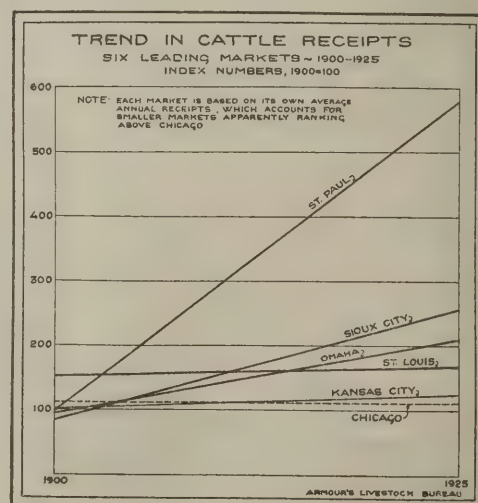




Colorado and Kansas, where the buyers for the two regions meet in active competition. While theoretically this sharp competition should help the producer, on the other hand it handicaps him seriously, because he can never know to what extent he can expand and just what cost of production is justified for him in trying to supply market demands. Too often, he will prepare for west coast outlets only to find when his hogs and cattle are ready that the east coast is the only agency in the market. Until more perfect adjustment between the consumptive conditions of these two markets develops, the producer of the territory between is going to face serious difficulties.

Along with the development of new livestock markets in the far west has gone the working out of plans for more orderly marketing methods. In California the Cattle-men's Association has evolved a co-operative plan for marketing cattle which is designed to prevent gluts and maintain stable price levels. Under this plan, the marketing of cattle is carried on through the Association. Orders are placed with it for the number and quality of cattle desired, and these orders are filled by the Association's field agents. The range price is based upon the quality and the delivered value at the larger market points. The producer pays the freight directly, whereas at the central markets he pays it indirectly in reduced prices for his cattle. Furthermore, the producer knows at the time of the grading of his cattle, the price which he will receive, and if this is unsatisfactory he can hold his cattle at home without the expensive shrink he has to face when the cattle are at the central market.

Another solution of the orderly marketing question is being developed by the Colorado Stock Growers' Association, which, through the co-operation of commission men, railroads, order buyers, yard traders, packer buyers and feeder buyers, in fact all the central market agencies, was able through 1925 to distribute arrivals on the Denver market much more evenly than before, throughout both the days of the week and the general marketing season. This adjustment to demand was sufficiently accurate to maintain the outlet steadily and to place more cattle on the market at higher price levels. These two attempts by state associations represent typically the differences between the direct and centralized marketing systems, a topic which will be discussed in the next "Monthly Letter."



# MONTHLY LETTER TO ANIMAL HUSBANDMEN

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MARCH, 1926

## COMPETITION OF DIRECT AND CENTRALIZED MARKETING

Every three or four years when the hog cycle reaches the low point of receipts, agitation of the subject of direct marketing develops. Exponents of the central markets point out that if direct marketing is "carried to its logical conclusion" the central markets will be destroyed, or will have "mere handfuls" of shipments for which little competition will exist. Since the topic is generally treated in alarmist phrases, and since considerable agitation on the subject exists at present, a study of the competitive features involved is of interest.

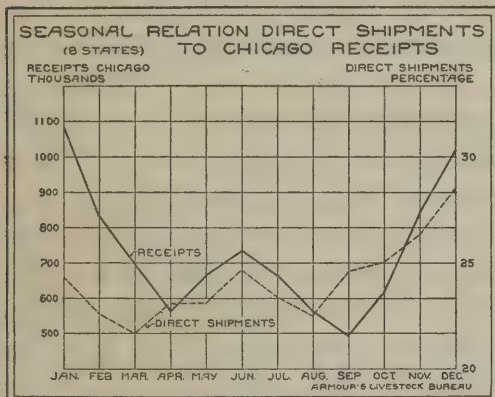


FIGURE 1

As ordinarily considered, direct marketing of livestock consists of the immediate sale by the producer to the packer or other processing agent, without the intervention of the usual services of the so-called middleman. The majority of livestock produced by the small farmer usually passes through the hands of local buyers or shipping associations, commission salesmen at the markets, and occasionally through order buyers and market speculators, to the packer. Direct marketing implies the abolishing of some one or more of

the intermediary steps. The more direct the marketing, the fewer the hands through which the livestock passes between producer and packer, and conversely. It has sometimes been stated that the length of time between the arrival of livestock for slaughter and the fixing of the sale price is a measure of directness or indirectness of a marketing system, but this viewpoint is scarcely economic. Marketing of the Danish type, in which the producer has to wait for returns from the sale of his product through the co-operative packing houses, or of the South American type, in which the producer is paid on the basis of carcass weight, is just as direct from the standpoint of marketing and distribution, as is the cash sale of the live animal at the centralized American market, because it does not involve the addition of more intermediaries. In fact, although the settlement is slower, the method of marketing is usually much more direct, since the animals pass through fewer hands from point of production to point of consumption.

All marketing of livestock has for its purpose either sale to meat packers for immediate slaughter, or sale for the purpose of further feeding and fattening preparatory to final sale for slaughter. Historically, the original and the simplest form of all livestock buying was direct marketing, which grew to a large volume prior to the Civil War, due to the fact that the packer could buy sufficient supplies of livestock near his plant. Centralized marketing developed after the Civil War, partly because of the long distance separating livestock supplies from packing centers, as well as producing from consuming regions, and partly because of the obvious advantages of big volumes of assembled live-

stock and large numbers of competitive buyers. For example, at such a market as Chicago, there is, *first*, a great number of buyers who can bid on each individual farmer's livestock. Perhaps only five to ten bids are made directly on any single load; but the mere existence of 600 potential buying agencies at Chicago provides a pressure for quick action and accurate evaluation on the part of all others. *Second*, the producer has the advantage of the services of a skilled salesman working for him; namely, the livestock commission man. *Third*, continuous published records of receipts and prices for many years help the producer and packer to plan their operations wisely. *Fourth*, the centralized market offers the buyer an assortment of classes and grades of livestock at a cost far less than obtainable through direct buying in the country. *Fifth*, the centralized market offers an advantage to the producer in heavy fills from feeding and watering not usually available in direct shipping.

At the same time, there are certain disadvantages in the method of selling through central markets. *First*, and most conspicuous are the risks incurred by the producer of striking an unfavorable or glutted market. Once his livestock is loaded, he has committed it to the trade and must sell it, because of relatively heavy costs of holding at the market, even though prices have dropped during the interval between loading his animals and the time they are ready to sell. *Second*, the producer must stand the risks of shrinkage, deaths, disease, and live condemnation, which he need not carry if the settlement for his animals is made on home acreage. *Third*, the producer has difficulty in controlling marketing costs, either of yardage and feed, or commission fees. In general, he can keep it within certain limits by increasing direct selling, or by going out of business when marketing costs get too great, but this latter method is not a satisfactory economic procedure. Since nearly all the central market fees are fixed by the Packers and Stockyards Administration, and since competition of sales agencies exists in services rather than in costs, there is nothing to prevent their number from multiplying until the division of business increases the overhead expense to a point where the sales agencies receive such small profits that they can show a logical reason for increased fees. While no central market agencies theoretically desire fee increases, when conditions are such that too many are in business, the necessity is likely to be forced upon them.

Direct marketing also possesses certain definite advantages. *First*, direct marketing involves no charges such as commission fees, yardage fees, feeding and handling and switching charges. *Second*, the closer to the farm the producer is able to sell his livestock, the fewer the risks he must run. *Third*, by being able to feed his stock enroute on low-priced farm feeds rather than on higher-priced feeds at the market, the producer cuts down shrink in shipment, though this prevents large fills at the market.

The disadvantages of direct marketing are just as obvious. *First*, producers are less experienced than professional salesmen in disposing of their product. *Second*, except in range country, the number of livestock available from one producer, or at one point, is likely to be so small as to increase materially the buying expense for the packers, and thereby contribute to the general overhead of the business. *Third*, direct marketing does not provide a broad and satisfactory system of obtaining price quotations.

Today, marketing commonly classified as *direct* takes various forms or types:

1. The local buyer or shipper who pays cash and ships to a variety of outlets. (Many ship to central markets, but fully as many ship direct to slaughterers.)
2. The local shipping association which operates in practically the same way, except that its payment is made after sale at the market or packing house.

3. The packer buyer who travels directly in the country, buying on ranch or farm.
4. The packer concentration point, established in producing areas where cash is paid for animals shipped directly to the packer.
5. Buying at small public markets, like Peoria, Bloomington, Springfield, Nashville, etc., where the packer bases his cash price on the nearest central market, less the freight differential. (This is really a form of centralized marketing, although such animals are usually classed as "directs" when received at the point of slaughter.)
6. Buying at one central market and forwarding direct to packing plants at another. This is the system in common vogue for Eastern packers who must secure a stable volume of supplies not available at their local markets, and is also used by national packers to equalize their slaughter between their packing houses at different points. (This also is really centralized marketing, although the animals are called "directs" at point of slaughter.)
7. Direct shipment to packing plants where price is adjusted grade for grade on the basis of some convenient central market for that day, with freight differentials included. Many Iowa, Minnesota and Wisconsin packers follow this system, as do certain subsidiaries of larger packing companies; for example, the Omaha Packing Company at Chicago and the Fowler Packing Company at the Mistletoe Yards, Kansas City.
8. In the case of some packing companies, payment to local shippers is based on the day of shipment rather than on the day of arrival, in order to remove the risk for the shipper and thereby make certain the volume of supply. This is commonly practiced by companies away from the central market, which establish quotations including freight differential from a nearby public market.
9. Marketing indirectly from the ranch or farm through the agency of the state livestock association as practiced by the members of the California Cattlemen's Association. The members of the Association report the number of cattle they have available and the time when they will be ready for market, and the agent of the Association directs the buyers to each producer at the proper time. Small shippers are handled by the Association's field agent, who collects the animals at nearby shipping points and forms carload lots of them there, giving the packer buyer an opportunity to bid on them at that point.
10. Direct marketing of feeders has developed in some instances through—
  - (a) Purchases by the feeder on the range;
  - (b) Sales of standard cattle and sheep to the feedlot on representation by grade;
  - (c) Mail order sales of standard animals, as practiced by the S. M. S. Ranch, Stamford, Texas; and
  - (d) Auction sales of range animals throughout the feeding districts, as practiced by the Highland Hereford Association and others.
11. Contracting livestock by feeders before birth, as practiced in the sheep industry since 1922. This involves no special standards, but implies a knowledge of the product of the producer on the part of the feeder purchaser.

All of these types of direct marketing have both advantages and disadvantages, but they arose in direct response to particular economic conditions.

The fundamental reason for fluctuations in the volume of direct buying as compared to the volume bought on central markets, is seen in Figure 2. This shows how the percentage of slaughter at 67 markets decreases when hog supplies are short, the percentage

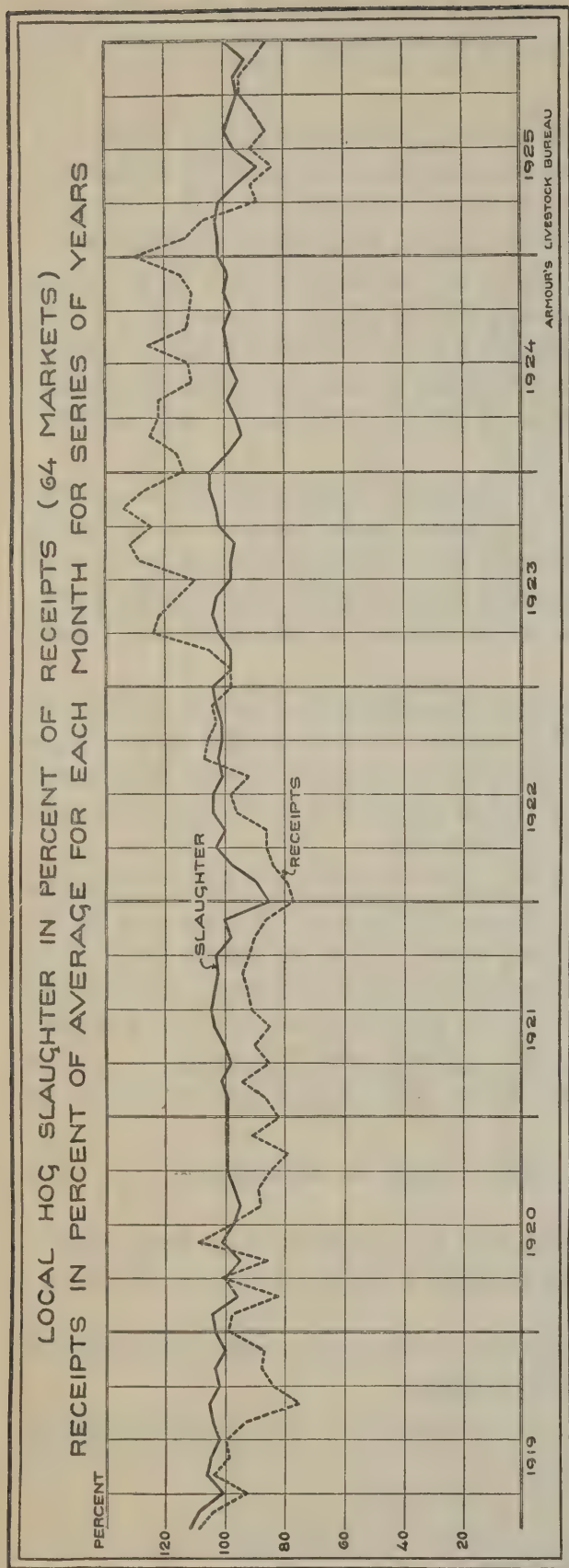


FIGURE 2

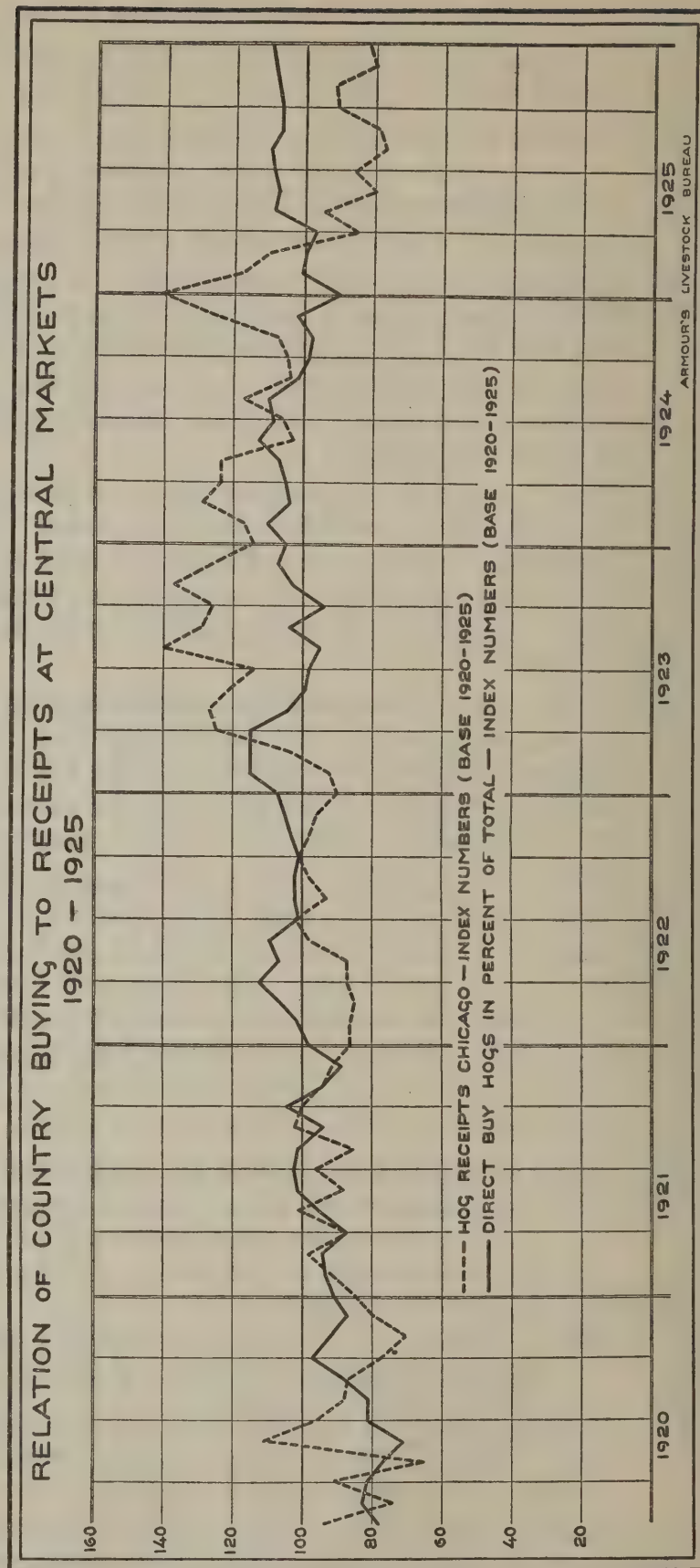


FIGURE 3

of shipments increasing correspondingly. Conversely, when receipts are large, local slaughter increases and shipments decrease. Normally, as supplies run short the animals pass through more hands and the packer is less certain of getting his supply. This makes it necessary for him to go nearer to the source of production in order to assure himself of the necessary animals to support his business. This is particularly true of hogs and occasionally of lambs, but is practically never true of cattle, which must be bought by grade and cannot be purchased as a general commodity.

Direct buying usually continues until the costs of hogs purchased in the country reach such a point that the packer sustains a loss, when he begins to increase his purchases on the central markets; in fact, direct marketing runs in cycles which are approximately the inverse of the normal production cycles. Figure 3 presents this situation by months for the last six years. While slight exceptions to exact inversion exist, it will be seen, in general, that when receipts increase, the percentage of direct shipments decreases and vice versa. During the period of 1923-1924, when receipts at the central markets increased abnormally, the percentage of direct marketing dropped to a lower level. On the other hand, during 1921 and 1922, direct buying of hogs outside of the big markets was at a high level in relation to receipts. The idea that direct marketing is increasing to the disadvantage of the centralized market is refuted by the statistics of the United States Bureau of Agricultural Economics. Since 1920, direct shipments from the states of Wisconsin, Minnesota, Iowa, Missouri, North Dakota, South Dakota, Nebraska and Kansas, show the following proportion of direct marketing on hogs within this area:

Year .....	1920	1921	1922	1923	1924	1925
Percent Direct Marketing .....	20.2	23.4	25.7	25.6	25.3	25.8

For the last four years the percentages have been so nearly stable that it clearly shows direct marketing is not increasing at the expense of the centralized market. On the other hand, in the state of Iowa, there has been some increase in the number of animals marketed direct. Since many of these, however, go to Iowa and Minnesota packers, who are not located at centralized markets, it is doubtful whether the increase is significant.

The proportion of direct buying varies seasonally. Figure 1 compares the average monthly percentage of hogs purchased direct for the last six years with the rate of receipts of hogs in Chicago. Contrary to the inverse relationship which applies over a period of years, the seasonal trend of direct marketing tends to parallel the trend of receipts; increasing as receipts increase, and decreasing as they drop. There is a tendency in the percentage of direct buying to anticipate the seasonal changes in receipts by about a month. Thus the spring low point in direct buying occurs in March, but in receipts in April. The fall low point in direct buying occurs in August, but is not reached in receipts until September. Similarly, the high point in direct buying is reached in December, but in receipts it has come in January. With this anticipation of one month, however, the correspondence is excellent.

The reasons for the problem, to which reference has been made, of the increasing costs of hogs purchased direct from the country, are apparent. It has already been mentioned that the nearer the packer approaches the point of production, the greater become the risks of shrinkage, mortality and other marketing hazards, which he must assume. Furthermore, it has been pointed out that country buying increases only with shortages in central market receipts, and the keenness of the competition to secure animals ahead of a rival buyer pushes the country buying to higher and higher levels until the consuming trade will no longer absorb the rising prices. These two factors combine to apply the brakes effectually to further development of the country buying system.

It is frequently claimed that packers go to the country for the purpose of reducing the cost of their raw material. This statement is inaccurate. Direct hogs, grade for grade, cost more alive than hogs bought at the central markets, seven times out of eight. *The packer goes to the country not to reduce his costs but to assure himself of his livestock supply.* The offsetting factor against the increased cost is the certainty of supply and the protection against irregularities in operation. Under the direct shipping system, scarcity and gluts do not occur, and the rate of operation, the size of slaughter gangs, cutting gangs, etc., as well as other variable factors in operating costs, can be forestalled.

Proponents of livestock exchanges at the central markets make numerous additional charges against the justice of the direct buying system to the producer. Most of such charges are clearly dictated by the self-interest of the commission man. Typical of this is the statement that the producer has no voice in price making when he sells direct, but instead must accept quoted prices. As a matter of fact, in most systems of direct buying, the producer has greater latitude in trading, since the closer to the farm his sale occurs, the more chance he has to execute his choice as to sale or retention of his livestock, and the less expensive carryovers to next day's or next week's market become. *Competitive prices are not determined alone by competitive bidding.* There is probably no more keenly competitive industry in the United States than the automobile industry, yet all of its sales are made on the basis of quoted prices from seller to buyer. The prices quoted by the seller must be of a nature that facilitates trade to the highest degree. The same principle applies in the quotation of prices by packers under the direct marketing system, and the advantage of selling so near home gives the producer even greater price determining influence on the average. This is because his freedom of selling choice is very small once his livestock is committed to the central market due to costs of market services, feeding, etc. On the other hand, the up-to-date information of the trade is less available to the producer, and he has less opportunity of using his nearby trading advantages as wisely.

Other charges made by the representatives of the livestock exchanges are as clearly without important foundation. In direct marketing of the Cudahy Brothers and Mistletoe type already mentioned, it is pointed out by them that delay in settlement until the close of the day's trading also prevents the producer from having a voice in the price. The competition of other market outlets is even more pressing in trading of this type than in the country trading discussed, and the establishment of fair quotations from the buyer is even more imperative. As a matter of fact, the seller of livestock at such a point operates under the same privileges as at the public market, for his hogs can be reshipped or held over on the same basis, so that the disadvantages he may feel on the direct shipment market are the same he encounters on the centralized market.

It is usually charged further that the packer buyer sorts his hogs by grade more closely under the direct buying system. This is undoubtedly true, but it is questionable whether this results in adverse sales returns. Inaccurate sorting is a type of inefficiency in marketing that broadens the price margin necessary for processing, distributing, selling, and other market operations, that creates a tax on the entire industry, and that operates either to decrease consumption or production in the long run. In all classes of business it is well known that small individual gains made by inefficiency on the part of one factor in the trade, or by misrepresentation, operate adversely from the standpoint of fluidity and increase in business, to a degree many times the original profit or loss when measured in money. Inaccurate sorting is a waste of this type, and for the occasional producer who may gain, there are numbers who lose on the general price level just because this type of inefficiency and waste must be cared for.

Probably the nearest to a "bogey" raised in the arguments on direct versus centralized marketing is the dual one frequently mentioned that the packers are using direct marketing to destroy the central markets, and that thereafter they will divide the territory in which they buy, and manipulate prices as they desire. No argument could be more futile. The packers need the central markets, but, entirely apart from any supposed desire of theirs, Figure 3 clearly demonstrates that during the last four years the general level of direct marketing is constant—which certainly means it is not being used to the detriment of the centralized markets. The hinted division of country territory would be just as effectually prevented by the anti-trust laws, although the packers already know that their own interests would prevent parcelling producing territory for buying purposes.

The only essential argument involved in the competition between direct and centralized marketing that is not selfish, and that is invested with broad public interest, is the effect on the price level. Since quotations are established on the central market, can direct shipments be manipulated to affect the price level? *A fair price level is the one that promotes the greatest exchange of products between producer and consumer.* In the case of livestock, it is probably the highest level at which the consumer will take all the existing supply, as the number of cattle, hogs and sheep must be planned by the producer in advance. Since intermediary services are required to transform livestock into meat and to care for distribution, the price level to the producer is obtained by deducting the gross costs of operation of the *most inefficient* intermediary businesses that must remain in operation in order to perform the total volume of services. This explains why inefficiencies from error, bad business practice, and inaccurate grading, as already referred to, react on all producers regardless of any individual's temporary gain.

Having established the factors of cost that intervene, however, the price level of livestock is determined directly by the relation of supply to demand. In general, it will be determined by the broad reaction of the one to the other. The first point to consider is whether variations in the proportion marketed direct and through centralized points can affect it. Last year about 68 million hogs were slaughtered in the United States. Of these some 44 million were shipped through central markets, and an additional 10 million were shipped direct to packers operating in part on these markets. Obviously, 44 million out of 68 million were enough to register the reaction of supply and demand at the 64 public markets under government supervision. If there had been 46 or 48 million that passed through these markets, it is difficult to see how the price level could have been modified, nor would it have been modified if only 40 or 42 million had been so handled. The total relation of supply and demand would have remained the same. Market information is so widely available and so quickly secured by means of telegraph, radio, market papers, etc., that the interaction of supply and demand must obviously be the same whether 40 or 50 million hogs out of 68 million pass through the central markets. In fact, changes in relationship can only come through an actual increase or decrease in the number of livestock or the consuming outlets.

It is also claimed that direct shipments to packers diminish demand and hence competition on the open market. This idea is ridiculous since *each direct shipment not only supplies part of the packers' demand, but just as urgently diminishes the available supply in the country.* Roughly speaking, every head of livestock shipped directly diminishes the number of animals which would normally go through the central market, and the demand which direct marketing satisfies is diminished to no greater extent than the existing supply. On the average, it leaves the relation between supply and demand just the same as it was before the direct shipment was made.

This leads to the final point of contention, namely, that the packer is able to use increased or decreased volumes of direct buying to manipulate prices on the central market. To quote a recent statement from an official of the Chicago Livestock Exchange: "Recently, in an attempt to break prices at Chicago, country buying packers refused to take hogs at interior concentration points late in the week, for the purpose of throwing a heavy run into Chicago on Monday, thereby breaking prices to enable them to mark tickets in the country lower." Such arguments are absurd. In the first place, hog production is at present light, and packers would be hurting themselves to indulge in a practice that would still further tend to discourage breeding. *Breaks in price decrease, never increase, production.* In the second place, if the statement were true, the marketing of hogs at central points was temporarily increased, which is the goal of the livestock exchanges. If, in addition, prices dropped under increased central market receipts, it is only what would be expected to happen normally, and if the appearance of oversupply produced was artificial, it perforce disappeared the following day, when shortage was again realized. Country price quotations are not based on Monday markets alone, but on the public market the day that trading takes place.

It is questionable whether the argument that direct buying is used to cheapen the cost of hogs during the seasons of shortage is an argument against the direct marketing system. Providing that the claim of the livestock exchange is correct, that prices at the central markets are reduced at this time, it is probable that such a reduction would be desirable, since it would prevent the extreme upper points in the hog price cycle from being realized. This is in the interest of stability in prices and tends to check the extreme expansions in production which would otherwise occur, thereby minimizing the subsequent low prices. While the producer who has hogs in times of scarcity may be slightly affected in his total profits providing the theory of temporary price depression is correct, producers in general would gain materially through the hog cycle. It is doubtful if direct buying lowers peak prices at the central markets, but, if it does, it is undoubtedly more a benefit to producers in the aggregate than an evil.

In conclusion, it would appear that the competitive issues between direct and centralized marketing have been beclouded due to the self-interest of the exponents of each method. This is perfectly natural, but fails to contribute to the economic analysis of the situation. The foregoing discussion brings out the following points:

1. The volume of hogs passing through the central markets, compared to the volume shipped direct, tends to increase and decrease in cycles corresponding to rates of farm production.
2. During the last four years there seems to have been no rise in the secular trend of direct marketing, although the level is above that of the immediate post-war deflation.
3. Seasonally the proportion of direct marketing increases with receipts and vice versa—the opposite of the secular relationship.
4. Each marketing system acts as a competitive check on the costs of the other, neither being destructive of the other over a period of years.
5. Direct hogs cost as much per live hundredweight as hogs at central markets, and usually cost more the longer the necessity for direct marketing lasts, but the added expense increases the certainty of securing the packer's raw material.
6. The price level is unaffected by the usual variations of the ratios of direct and centralized marketing.
7. On the occasions when direct marketing results in cheaper hogs, it minimizes price fluctuations and stabilizes the price level.







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